

CLAIMS

What is claimed is:

- 1        1. A method of coating a substrate, comprising:  
2                providing a substrate having a surface;  
3                forming a polymeric layer on the surface of the substrate by applying  
4                a layer of a polymeric precursor to at least a portion of the surface;  
5                polymerizing the polymeric precursor to form a polymerized layer; and  
6                applying a metal coating to at least a portion of the polymerized layer;  
7                wherein the metal coating is applied under sub-atmospheric conditions.
  
- 1        2. The method of claim 1, wherein the step of applying the layer of the  
2                polymeric precursor is performed using an electrophoresis process.
  
- 1        3. The method of claim 2, wherein the step of forming the polymerized  
2                layer includes elevating the temperature of the polymeric precursor to a temperature  
3                of at least about 320°F.
  
- 1        4. The method of claim 2, wherein the polymeric precursor is selected  
2                from the group consisting of acrylics, epoxies, urethanes, and combinations thereof.
  
- 1        5. The method of claim 1, wherein the substrate is porous, and further  
2                comprising leveling the surface of the substrate before the step of applying the metal  
3                coating.
  
- 1        6. The method of claim 5, wherein the metal coating is applied using a  
2                physical vapor deposition method.

1           7. The method of claim 6, further comprising the step of removing a  
2 portion of the polymerized layer before applying the metallic coating.

1           8. The method of claim 7, further comprising cleaning at least the  
2 polymerized layer before the step of removing a portion of the polymerized layer.

1           9. The method of claim 6, wherein the metal coating is applied in a  
2 pressure range of about  $5 \times 10^{-4}$  millitorr to about  $2 \times 10^{-5}$  millitorr.

1           10. The method of claim 6, wherein the metal coating is applied by  
2 evaporation.

1           11. The method of claim 3, further comprising maintaining the polymeric  
2 precursor at the temperature for at least about 12 minutes.

1           12. A method of coating a surface, comprising:  
2                   providing a substrate;  
3                   coating at least a portion of the substrate with a layer of an  
4                   electrophoretically applied polymeric precursor;  
5                   polymerizing the polymeric precursor to form a first polymeric coating;  
6                   and  
7                   elevating the temperature of the polymeric coating to at least about  
8                   400°F for at least about 6 minutes.

1           13. The method of claim 12, further comprising applying a layer of metal  
2 over at least a portion of the polymeric coating.

1           14. The method of claim 13, further comprising applying a second  
2 polymeric coating over the layer of metal.

- 1        15.    A method comprising:
  - 2                forming a polymeric coating from an electrophoretically applied
  - 3                polymeric precursor and applying a layer of metal over the polymeric coating using
  - 4                a physical vapor deposition process.
- 1        16.    An article having a porous surface, comprising:
  - 2                an electrophoretically applied first polymeric layer overlaying and in
  - 3                direct contact with the porous surface; and
  - 4                a metallic layer overlaying the first polymeric layer.
- 1        17.    The article of claim 16, further comprising:
  - 2                a second electrophoretically applied polymeric layer overlaying and in
  - 3                direct contact with the metallic layer.
- 1        18.    The article of claim 16, wherein the article is selected from the group
- 2                consisting of plumbing fixtures, jewelry, and utensils.
- 1        19.    The article of claim 17, wherein the article is selected from the group
- 2                consisting of plumbing fixtures, jewelry, and utensils.
- 1        20.    The article of claim 16, wherein the polymeric layer is a dielectric
- 2                layer.
- 1        21.    The article of claim 16, wherein the metallic layer is chrome.
- 1        22.    The article of claim 16, wherein the first polymeric layer has a
- 2                thickness ranging from about 1 millimeter to about 40 millimeters.

1           23. The article of claim 16, wherein the metal layer has a thickness ranging  
2           from about 0.1 millimeter to about 3 millimeters.

1           24. The article of claim 23, wherein the second polymeric layer has a  
2           thickness ranging from about 1 millimeter to about 40 millimeters.